

1 WHAT IS CLAIMED IS

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1. A semiconductor testing device for testing a semiconductor device which has at least one spherical connection terminal, said testing device comprising:

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an insulating substrate having an opening formed therein at a position corresponding to a position of said spherical connection terminal; and

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a contact member, formed on said insulating substrate, comprising a connection portion connected with said spherical connection terminal, at least said connection portion being deformable and extending into said opening.

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2. The semiconductor testing device according to claim 1, wherein said connection portion has a cantilever shape and extends from only one side of said opening.

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3. The semiconductor testing device according to claim 1, wherein said connection portion is supported on opposite sides of said opening.

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4. The semiconductor testing device

1 according to claim 2, wherein said connection portion
 is a wire.

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 5. The semiconductor testing device
 according to claim 3, wherein said connection portion
 is a wire.

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 6. The semiconductor testing device
15 according to claim 1, wherein said connection portion
 has at least one opening formed therein.

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 7. The semiconductor testing device
 according to claim 6, wherein said opening comprises a
 slit.

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 8. The semiconductor testing device
 according to claim 6, wherein said opening has a
30 circular shape.

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 9. Th semiconductor testing device
 according to claim 1, wh rein at least an area, of said
 connection portion, connected with said spherical

1 connection terminal, includes a roughened surface.

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10. The semiconductor testing device
according to claim 1, further comprising a
reinforcement member comprising an elastically
deformable material provided as a support for said
10 connection portion.

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11. The semiconductor testing device
according to claim 10, wherein said reinforcement
member comprises an anisotropic conductive rubber.

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12. The semiconductor testing device
according to claim 10, wherein said reinforcement
member comprises a net-shaped elastic member.

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13. The semiconductor testing device
30 according to claim 10, wherein said reinforcement
member comprises a balloon-shaped member containing one
of a gas and a liquid.

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14. The semiconductor testing device

1 according to claim 13, wherein an internal pressure of
said balloon-shaped member is changed after said
semiconductor device is loaded on said semiconductor
testing device.

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10 15. A semiconductor testing device, which is
used for performing a test on a semiconductor device
having spherical connection terminals, comprising:

15 a contactor, provided with a single layer of
insulating substrate, in which substrate an opening is
formed at a position corresponding to a respective one
of said spherical connection terminals, said contactor
also being provided with a contact portion, which
includes a connection portion with which said
respective one of said spherical connection terminals
is electrically connected, said contact portion being
20 provided on said single layer of insulating substrate
so that said connection portion is located on said
opening; and

25 a wiring substrate, on which said contactor
is mounted in a manner which permits installation and
removal of said contactor onto and from said wiring
substrate, said wiring substrate being provided with a
first connection terminal which is provided on a first
surface, on which said contactor is mounted, and is
electrically connected with said contact portion, a
30 second connection terminal which is provided on a
second surface, which is opposite to said first
surface, and is connected externally, and an interposer
which electrically connects said first connection
terminal with said second connection terminal.

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1 16. The semiconductor testing device as
claimed in claim 15, wherein said contact portion has a
thickness and a hardness such that said contact portion
can break an oxide film formed on said respective one
5 of said spherical connection terminals.

10 17. The semiconductor testing device as
claimed in claim 15, wherein an extending portion is
formed in said insulating substrate, said extending
portion extending in said opening so as to face said
contact portion, and partially supporting said contact
15 portion.

20 18. The semiconductor testing device as
claimed in claim 15, wherein a projection, which comes
into contact with said contact portion, is formed in
said opening, a certain portion of said contact portion
being moved when said respective one of said spherical
25 connection terminals is connected with said contact
portion, which certain portion is a portion extending
from a position to the extending end of said contact
portion, at which position said contact portion is
supported by said projection.

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 19. The semiconductor testing device as
35 claimed in claim 18, wherein said projection is made of
an elastic material.

1 20. Th semiconductor testing devic as
claimed in claim 18, wh rein said projection is made of
a conductive material.

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21. The semiconductor testing device as
claimed in claim 18, wherein said projection has a
10 spherical shape.

15 22. The semiconductor testing device as
claimed in claim 18, wherein said projection has a ring
shape.

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23. The semiconductor testing device as
claimed in claim 15, wherein a pointed-end portion is
formed at an extending-end portion of said contact
25 portion.

30 24. The semiconductor testing device as
claimed in claim 15, wherein a roughened surface is
formed on at least one of a surface of said contact
portion, with which surface said respective one of said
spherical connection terminals comes into contact, and
35 an area of said contact portion, which area comes into
contact with said first connection terminal.

1 25. The semiconductor testing device as
claimed in claim 15, wherein a roughened surface is
formed on at least a portion of said first connection
terminal, with which portion said contact portion comes
5 into contact.

10 26. The semiconductor testing device as
claimed in claim 15, wherein a positioning arrangement
is provided for positioning said contactor with respect
to said wiring substrate when said contactor is loaded
on said wiring substrate.

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 27. The semiconductor testing device as
20 claimed in claim 15, wherein said contactor is provided
with a non-connection portion at which it is not
necessary to electrically connect one of said spherical
connection terminals with said contactor, at which non-
connection portion an opening is provided but a contact
25 portion is not provided.

30 28. The semiconductor testing device as
claimed in claim 15, wherein the direction in which
said contact portion extends is set based on the
directions of relative displacement occurring between
said respective one of said spherical connection
35 terminals and said contact portion due to a difference
in thermal expansion between said contactor and said
semiconductor device.

1 29. The semiconductor testing device as
claimed in claim 15, wherein an opening is formed in
said contact portion at a position at which said
respective one of said spherical connection terminals
5 comes into contact with said contact portion.

10 30. The semiconductor testing device as
claimed in claim 15, wherein said wiring substrate
comprises a multi-layer substrate.

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31. The semiconductor testing device as
claimed in claim 15, wherein said insulating substrate
comprises a flexible film made of resin and having the
property of insulation, and said contact portion
20 comprises a conductive metal layer having flexibility.

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32. A semiconductor testing method for a
semiconductor device having spherical connection
terminals, comprising the steps of:

a) mounting a contactor on a wiring
30 substrate,

wherein:

said contactor is provided with a single
layer of insulating substrate, in which substrate an
opening is formed at a position corresponding to a
35 respective one of said spherical connection terminals,
said contactor also being provided with a contact
portion, which includes a connection portion with which

1 said respective one of said spherical connection
terminals is electrically connected, said contact
portion being provided on said single layer of
insulating substrate so that said connection portion is
5 located on said opening; and

 said contactor is mounted on said wiring
substrate in a manner which permits installation and
removal of said contactor onto and from said wiring
substrate, said wiring substrate being provided with a
10 first connection terminal which is provided on a first
surface, on which said contactor is mounted, and is
electrically connected with said contact portion, a
second connection terminal which is provided on a
second surface, which is opposite to said first
15 surface, and is connected externally, and an interposer
which electrically connects said first connection
terminal with said second connection terminal;

 b) loading said semiconductor device on said
contactor, mounted on said wiring substrate, so that
20 said respective one of said spherical connection
terminals is connected with said connection portion of
said contact portion; and

 c) testing said semiconductor device via said
second connection terminal, interposer and first
25 connection terminal of said wiring substrate, said
contact portion of said contactor and said respective
one of said spherical connection terminals.

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